

DPD-4656-59

MEMORANDUM FOR: Deputy Director, Plans

THROUGH : Acting Chief, DPD

SUBJECT : Catadioptric Lenses, Improved Emulsions and Sensors

REFERENCE : Memorandum for Chief, Technical Analysis Staff, DPD; DD/P4-6227

1. The problems of vibration, changes in air pressure and temperature associated with Catadioptric Lenses are recognized and understood by Doctor Scott and his associates at P & E. These problems are:

a. Vibration: The Catadioptric Lens might be described as a lens that cascades the light rays as they are passed through the lens to the focal plane. In another sense, the lens is a folded optical system using a series of mirrors to bend the light rays. If the mirrors and lenses of the Catadioptric Lens are not ridgedly mounted as a unit, vibration will exist causing a deteriorating effect on resolution.

b. Air Pressure and Temperature: Since the focal length tolerance of a Catadioptric lens is more critical than that of the refracting type, pressure and temperature changes acting upon the glass and metal components of the lens can cause sufficient change in the focal length to also degrade the resolution. This seems at present to be only an engineering problem to be solved.

The above problems have been discussed with Rod Scott in previous GUSTO meetings, and although he has indicated these are problems of some magnitude, he does not think they are insurmountable. The gain achieved through larger apertures, that is, f2 compared to f6 or f10, and the higher resolution capability is considered necessary and worth the effort and monies required to overcome these problems. The increased aperture (f2) will allow use of slower photographic emulsions with a better resolution capability, thus affording a much improved Photo Reconnaissance system.

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2. Both [redacted] are following all known developments for improved emulsions and/or Sensors. One such item is our recent procurement of 4,000 feet of Ansco High Scan Pan *Coated* on Cronar which will be tested at the test site in the very near future. The tests will be made with the B Configuration and compare High Scan Pan with our present film. Samples of this photography will be forwarded to Rod Scott for evaluation and consideration and possible use of the High Scan Pan in the GUSTO program.

3. A check with Headquarters ARDC shows that they are programming [redacted] on 25X1 Task No. 62171 to further investigate the use of single crystals of silver bromide for photographic purposes. No end product can be expected from this investigation within the next year. ARDC also indicated that additional funds at this time would not expedite the program. 25X1A

25X1A 4. [redacted] of PIG are planning to visit [redacted] 25X1A [redacted] to review their progress on infrared electrophotography. While there, they plan to discuss with [redacted] his proposed system for testing a complete aerial photo system while still in the design stage.

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